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TOWARDS AN APPROACH TO DECENTRALIZED STORAGE AND EXCHANGE OF BUSINESS PROCESS MODELS

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Abstract. This paper proposes an approach to decentralized storage and exchange of business process models using the blockchain technology and tokenization approach. There was proposed an idea of the Ethereum smart contract that implements the non-fungible token extended with syntactic and semantic properties, which can be used to evaluate quality and estimate value of tokenized business process models.

Keywords: business process modeling, blockchain, tokenization, smart contract.

Nowadays digital transformation is a trend of the enterprise management. In the first place, digital transformation is associated with Business Process Management (BPM) and its applications in business process modeling, and automation using BPM suites.

The main goal of business process modeling includes visual representation of business activities as graphical diagrams in order to identify and understand ongoing workflows, find bottlenecks for improvement, ensure communication between IT (Information Technology) employees and business stakeholders. Secure and peer-to-peer exchange of business process models could be organized using blockchain technologies, including cryptocurrencies and smart contracts.

The problem of business process models tokenization, i.e. representation of them as digital tradable assets on a certain crypto-platform [1], must be solved to reach such BPM-driven tokenomics.

The object of this research includes decentralized storage and exchange of business process models.

The subject of research is the approach to business process models tokenization using blockchain and smart contracts.

Business process modeling is considered as the approach to depiction of current or future organization activities driven by events and control flow logic [2]. Also in [2] business process models are named as the key tools for process-aware information systems design, business process re-engineering, and service-oriented architectures design [2].

Business process models are also considered as graphical knowledge resources and could be used as guidelines to introduce best practices for BPM adoption across multiple enterprises, as it is done by industry reference models that share knowledge of other organizations [2].

Thanks to the blockchain advantages [1], inter-organizational storage of tokenized business process models provides collaborative parties with the proof of authorship, censorship resistance, timestamping, and immutability.

Smart contracts and provide decentralized financial (DeFi) capabilities [1], such as peer-to-peer exchange of enterprise knowledge presented as business process models without need of any third-party authorities, i.e. banks or payment systems.

Therefore, the problem of business process model tokenization remains relevant and respective information technologies should consider latest trends of blockchain technology and digital economics.

Since in Spring 2021 NFTs (Non-Fungible Tokens) got a focus in global crypto attention, mostly for collectibles and digital art (the entire market exceeds 130 USD by Spring 2021) [3], it seems as a great opportunity to extend use cases of NFTs with tokenization of enterprise models, in particular – business process models.

The NFT type better suites business process models that are unique and unequal in terms of their syntactic and semantic properties, which could be used to define value of shared models.

There could be used the SEQUAL (Semiotic Quality) framework [4] for evaluation of syntactic and semantic validity and completeness of business process models given as graphic diagrams (i.e. images).

As for the blockchain platform, there could be chosen Ethereum as the pioneering and still leading smart contracts platform [5]. Thus, the ERC721 standard may be used for business process models tokenization.

However, the ERC721 standard should be extended with syntactic and semantic features of business process models.

After NFT is minted (i.e. published on the blockchain), syntactic and semantic features are used to evaluate validity and completeness of the process model in order to define its value for collaborating parties [4].

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МОДЕЛЬ ЗАГРОЗ КІБЕРБЕЗПЕКИ ДЛЯ БЕЗДРОТОВОЇ СИСТЕМИ ОПОВІЩЕННЯ

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CYBER SECURITY MODEL FOR HEALTH-FREE ENVIRONMENT SYSTEMS

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Анотація. В даній роботі сформульовані ключові аспекти моделі загроз кібербезпеки для систем сповіщення за допомогою бездротового мережевого зв' язку.

В ході роботи було проведено аналіз існуючих моделей загроз кібербезпеки, моделі порушника. Визначено, що дані моделі не є такими, які повною мірою описують проблеми кібербезпеки проекту. Тому метою роботи є розробка розширеної моделі загрози кібербезпеки, що побудована за допомогою моделі Cyber Kill Chain.